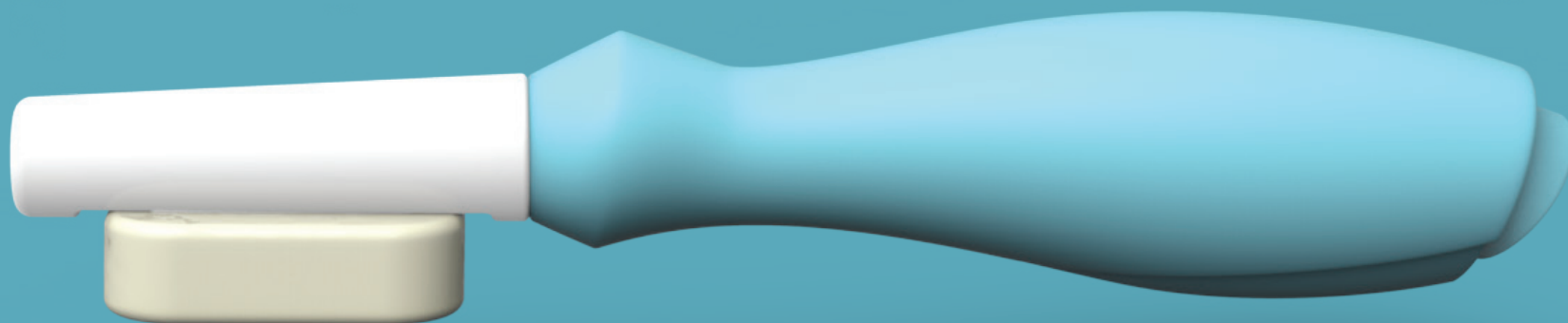


CLUTCH

Senior Thesis Project | Kennedy Dick



Disability Inclusion in the Beauty and Hygiene Industry

Research Thesis

Presented in partial fulfillment of the requirements for graduation
with research distinction in Industrial Design in the undergraduate
colleges of The Ohio State University

by

Kennedy Dick

The Ohio State University

January 2020

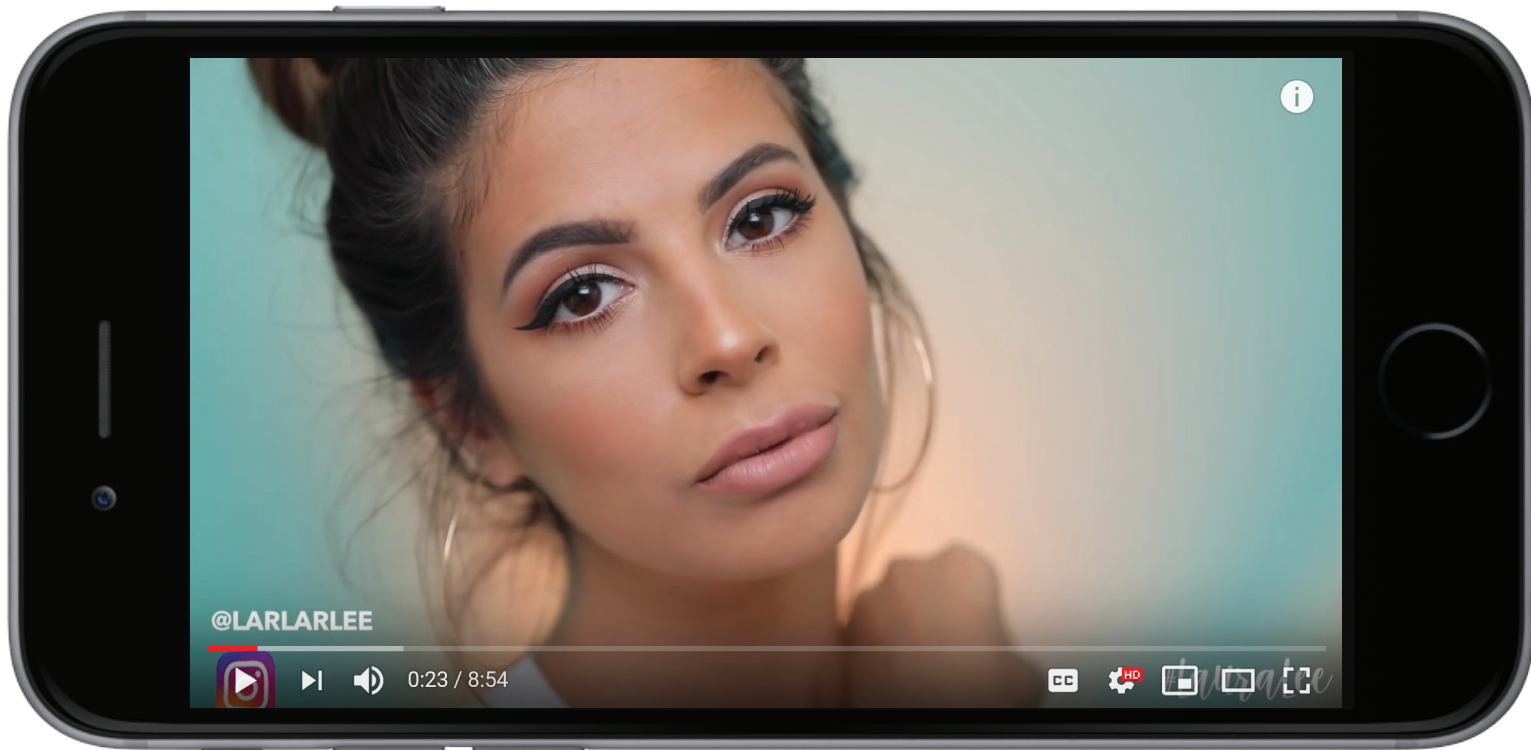
Project Advisor: Sébastien Proulx, Ph.D., Department of Design

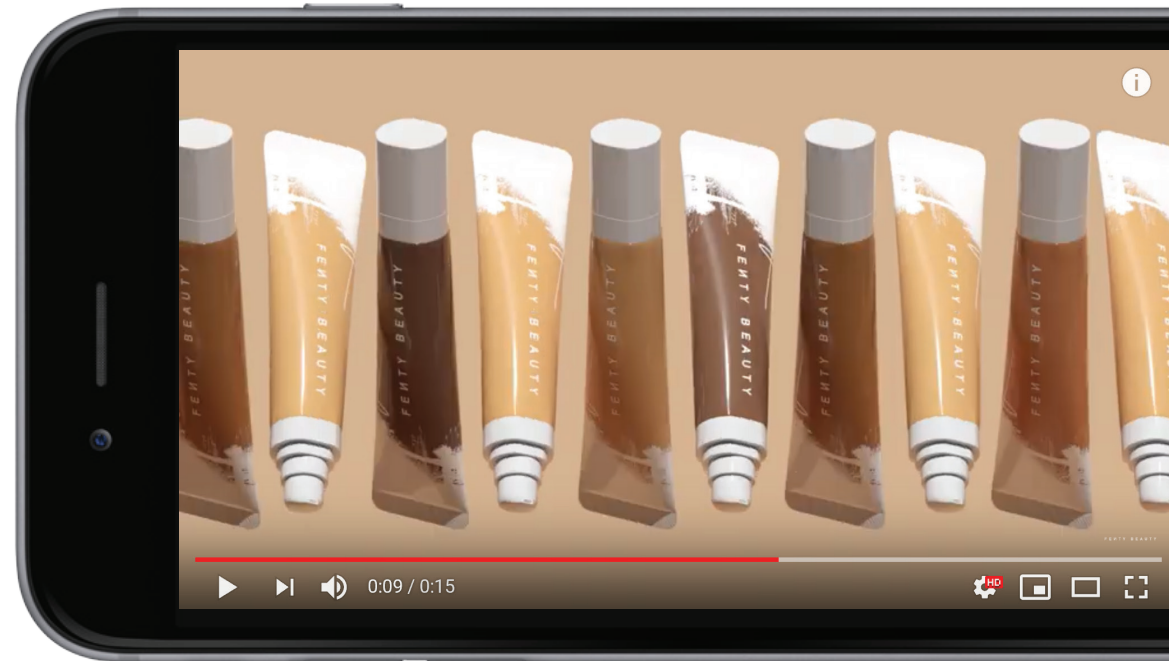
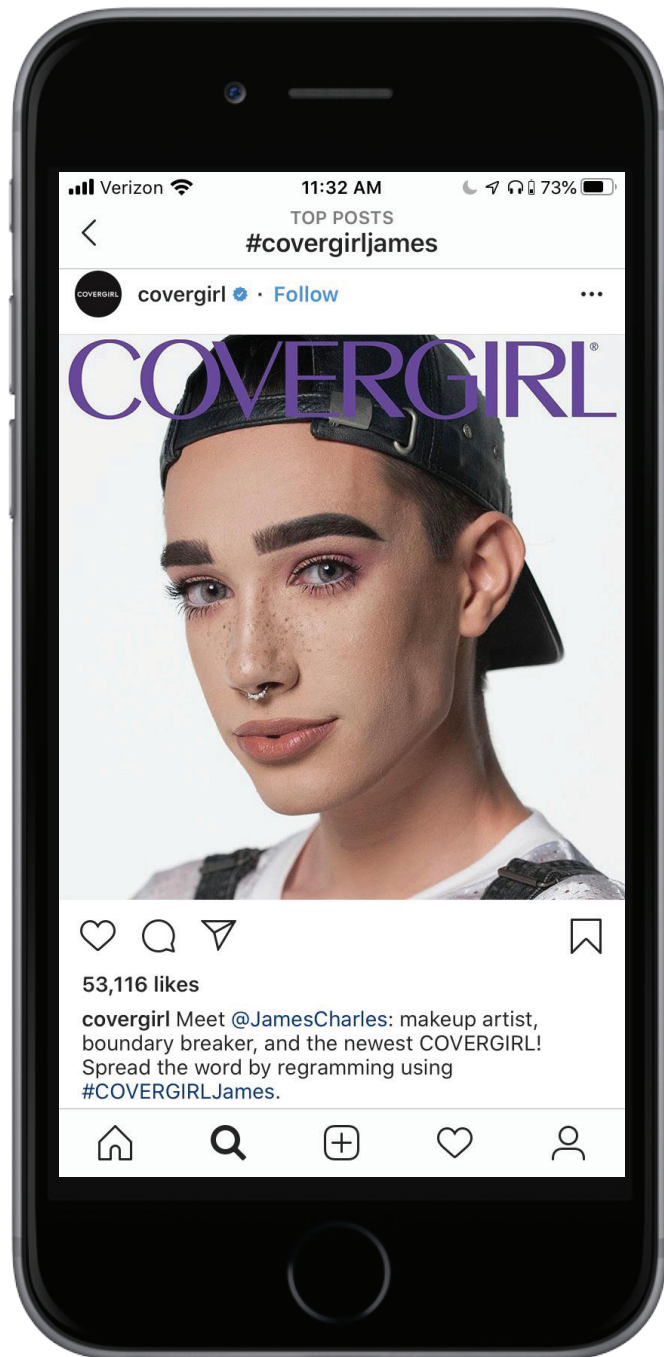
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CONTEXT

Product innovation and the rise of “beauty vloggers” have allowed the beauty and hygiene industry to experience rapid growth within the last few years.





As the industry grows, it has made efforts to become more inclusive by ensuring there are products for all skin types and supporting the use of makeup for self-expression by all genders.

Despite this...

The beauty and hygiene industry has made limited progress in promoting disability inclusion.

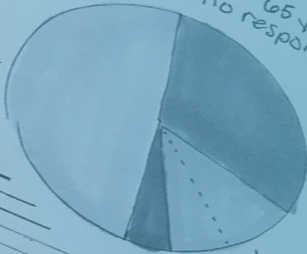
ARTHRITIS + THE EVERYDAY

Participant Demographics

AGE: 18-65 range

Type of Arthritis:

Psoriatic
47.96%
47 participants



18-25 yo: 18 participants
26-45 yo: 49 participants
46-65 yo: 16 participants
no respondents 66 yo +

OA 32.65%
32 participants

Osteo 8.16%
8 participants

Lupus 4.08%
4 participants

How long have you been living with Arthritis?

Less than a year: 8
1-5 years: 36
6-10 years: 19
10-20 years: 13
20+ years: 7

88% OF participants experience differences in their morning routine due to Arthritis

Top 3 areas of the body individuals focus on most when getting ready...

- 1 FACE
- 2 HAIR
- 3 TEETH



60%

have not altered beauty/hygiene products
INDIVIDUAL w/ psoriatic

40%

Have altered beauty/hygiene products

I also tend to try and put more effort into makeup to look less tired and hide facial rashes. I don't want to look sick, but getting ready is slow and stiff.

many individuals with psoriatic arthritis change products who formulas that irritate their skin. Other "hacks" include...

wall-mounted pump station

Hair dryer, blow drying/straightening

Continue →

RESEARCH

SECONDARY RESEARCH

research that utilizes existing data

ar•thri•tis

noun. painful inflammation and stiffness of the joints

Arthritis is a very common disease with more than *3 million US cases a year.*

Women, however, are more likely to be diagnosed with arthritis than men.

Arthritis also affects women differently than it does men and is more painful and more *likely to affect the hands.*





Universal Design

Designing with the needs of individuals with disabilities in mind leads to designs which are usable and attractive to everyone. One of the most famous products to have been designed for individuals with arthritis is OXO's Swivel Peeler.

Design “Hacks”

Unfortunately, not many products are designed with universal design principles in mind—especially in the beauty and hygiene industry. Individuals with arthritis, however, have created design “hacks” which alleviate difficulties in their morning routines.



One popular design “hack” is to place rubber pencil grippers on makeup brushes to make them thicker and easier to grip.

PRIMARY RESEARCH

research that generates new data

Professional Guidance

Consulting a Rheumatologist was beneficial in understanding some of the more complex nuances of arthritis and how arthritis is commonly treated.

Dr. Burns said she hadn't heard patients talking about using adaptive products and assumed this was because these products weren't widely known of or available.

Dr. Burns validated the need for arthritis-friendly products that are easily accessible.



Dr. Rebecca Burns

Rheumatologist at Columbus
Veterans Association

Online Surveying

“Sometimes I rely on my family for help showering or washing my hair. On really bad days, I need help with everything from going to the bathroom to brushing my teeth.”

– Individual with Rheumatoid and Psoriatic Arthritis

An online survey was conducted utilizing Qualtrics. The survey link was posted to a series of arthritis-related online forums, and a total of 88 participants responded.

Nearly 1 out of 4 participants rely on a family member or caretaker to help them get ready
40% of participants altered existing hygiene or beauty products to meet their needs



Kathey Scribner
Adult with degenerative
arthritis in hands and neck



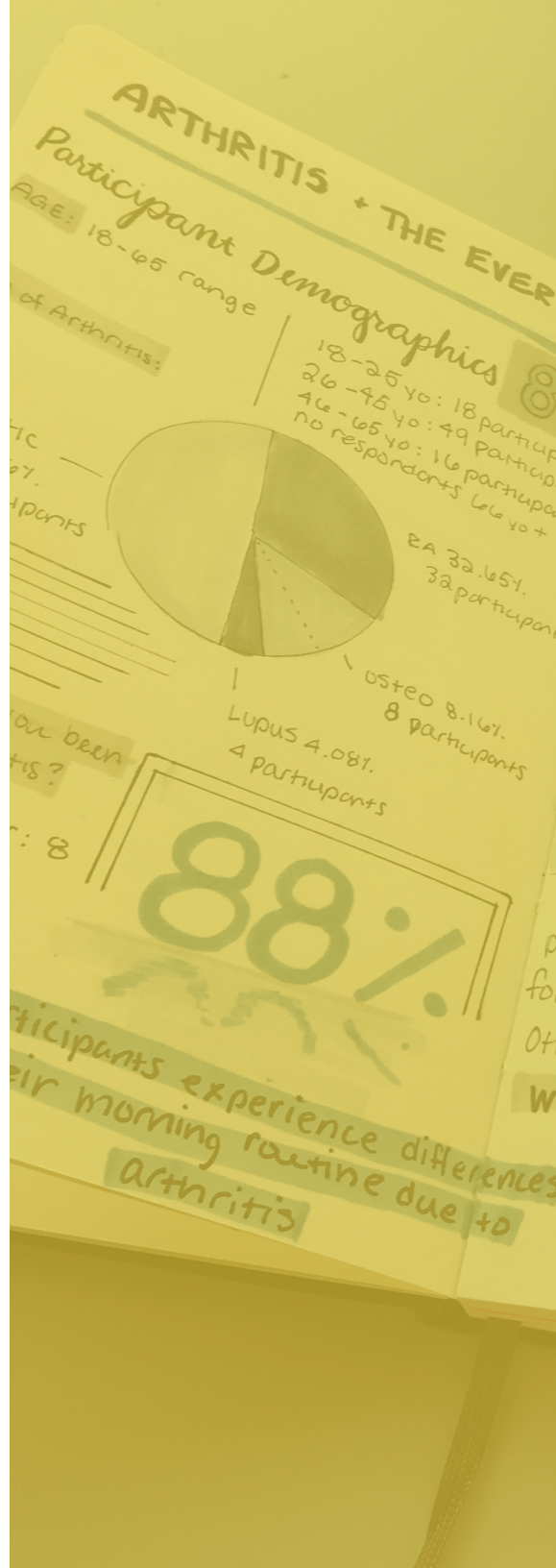
Monica Sengupta
Beauty blogger with
rheumatoid arthritis

Interviews

Semi-structured interviews provided an in-depth view of how arthritis affects everyday hygiene and beauty routines. Specific self-care steps both interviewees struggle with include applying **eyeliner**, styling their **hair**, and **shaving**.

Analysis

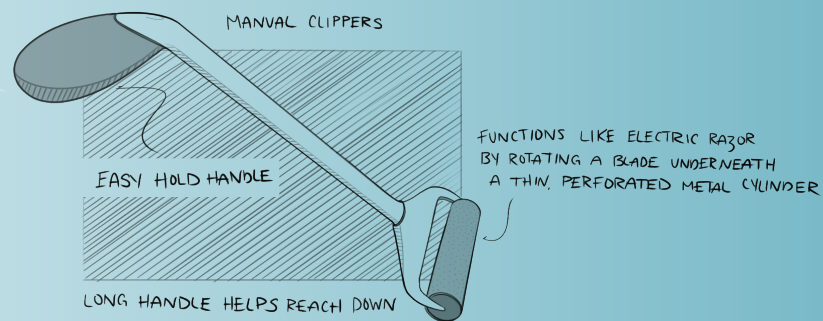
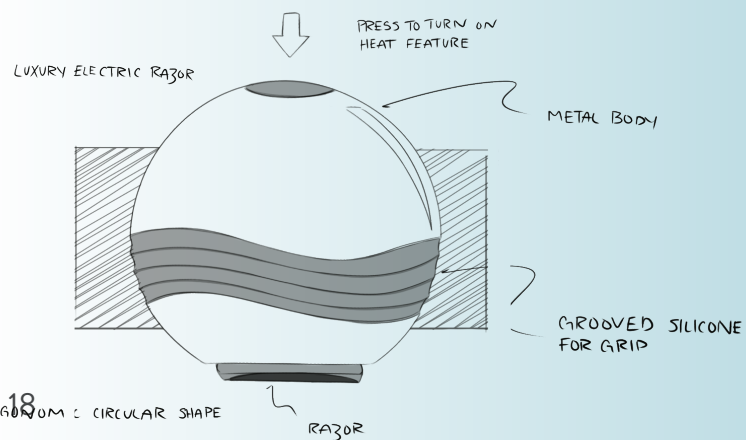
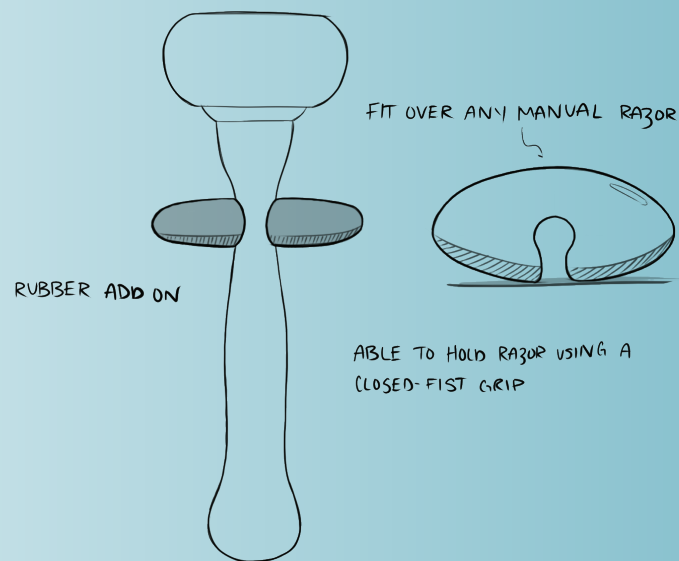
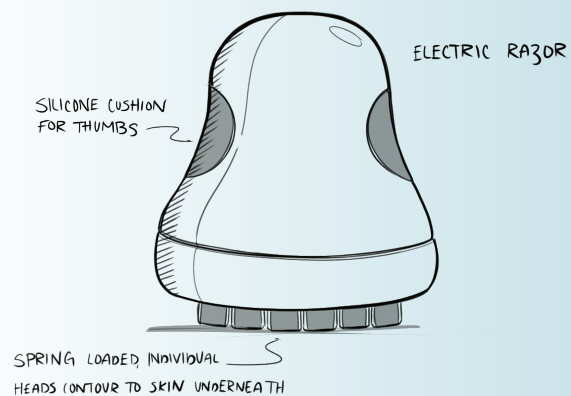
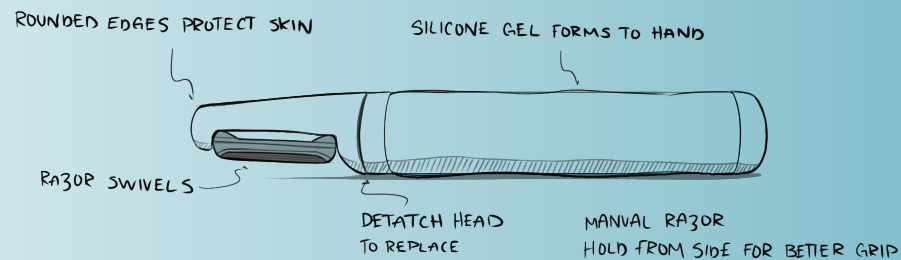
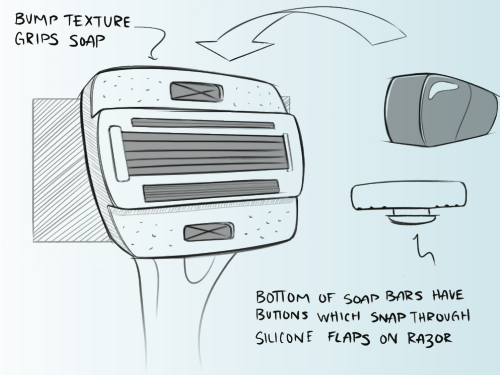
Many individuals with arthritis have to compromise their sense of freedom and privacy in order to get ready. Many respondents discussed adapting existing product to meet their needs—which often included wrapping fabric or tape around handles to make them thicker. Hair care, specifically shaving, was a large pain point discovered through research.



Problem Statement

Given that hair removal is often perceived as an element of basic hygiene and self-expression and that women with various forms of arthritis experience difficulties while shaving...

How might I develop a hair removal solution for women with inhibited upper body mobility?



Product Development

Ideation

Early concepts were generated using various concept generation methods such as...

“Divergent Thinking” Method

After creating a plane with diverse axes, I ideated a concept that satisfies each quadrant’s characteristics.

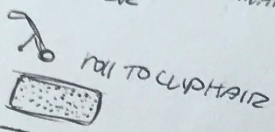
“City of Worth” Method

I ideated four concepts that each accentuate a specific mindset.

ANALOG

SEPARATE PRODUCT

ERGONOMIC PRODUCT
"MINI POWER" SIMILAR TO SWIVEL RAZOR



TAIL TO CLIP HAIR

MULTI-HEAD
RAZOR FOR
> SURFACE AREA



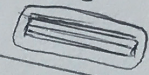
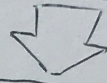
SPRING-LOADED
FORMS TO CURVE
CONTOUR

HEATED HANDLE
SOOTHES WORKING HANDS

SOLID SHAVING
CREAM ADD ON



ON TOP OF BLADES



Vibrations? Heated?

ADAPT EXISTING
PRODUCT



Wearable razor
goes up & down leg?

ELECTRIC

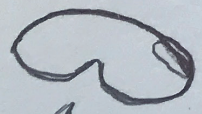
CIVIC WORLD-COMMUNITY
3D PRINTED ADD
ON TO THICKEN
RAZORS



CROSS
SECTION

MAKES
INDUSTRIAL WORLD
EFFICIENCY, SEEMS
THIS COULD BE AN
ADD ON...

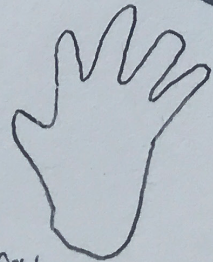
SUBSCRIPTION
SERVICE FOR NEW
HEADS ON THICKER
BODY



RAZOR FITS

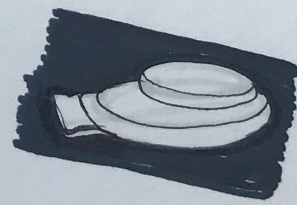
HAT IF THIS WAS
SILICONE

INSPIRED ART WORLD



Wearable m...

WORLD OF FAME

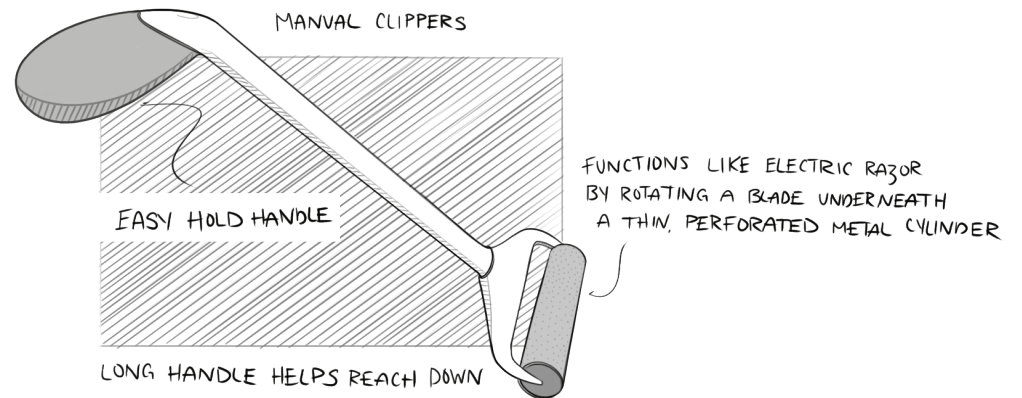
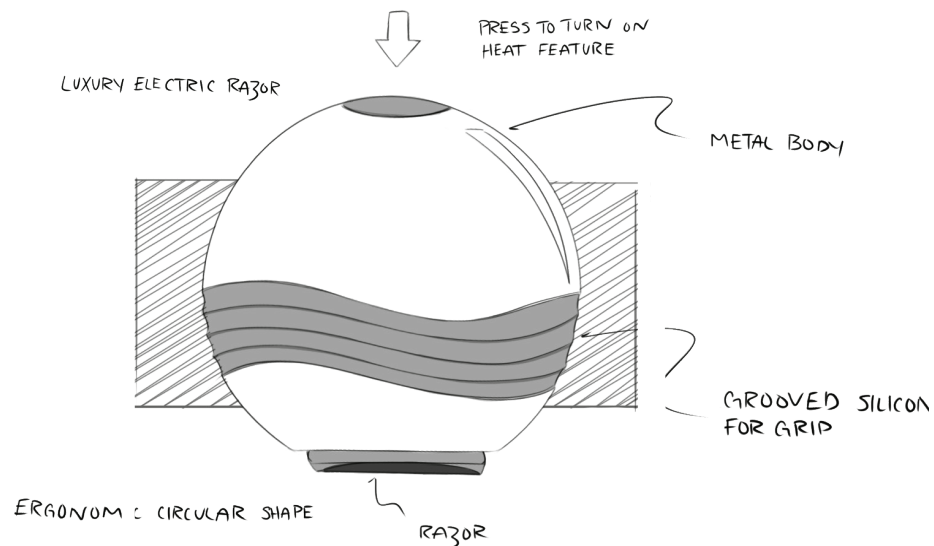


SUPER ERGONOMIC,
METAL + TITANIUM
MATERIALS

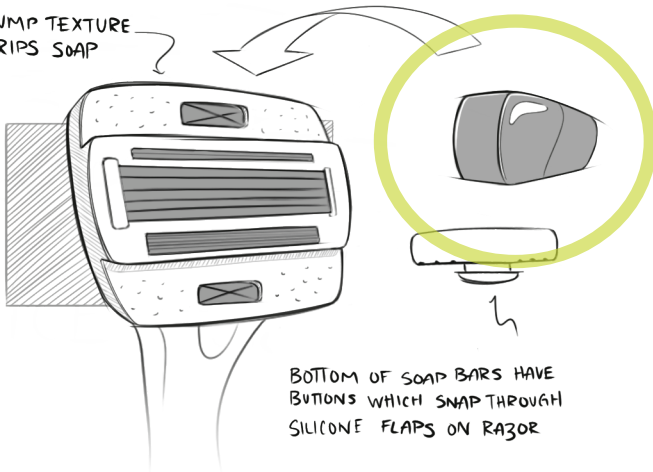
CITY OF WORSHIP METHOD

Concepts Become Designs

Details are added to the initial ideas to explore features and begin form discovery



BUMP TEXTURE
GRIPS SOAP



BOTTOM OF SOAP BARS HAVE
BUTTONS WHICH SNAP THROUGH
SILICONE FLAPS ON RAZOR

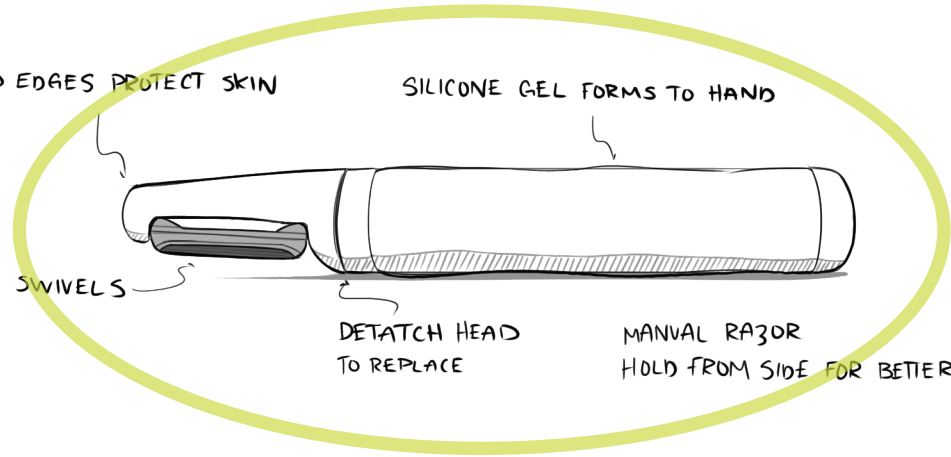
ROUNDED EDGES PROTECT SKIN

SILICONE GEL FORMS TO HAND

RAZOR SWIVELS

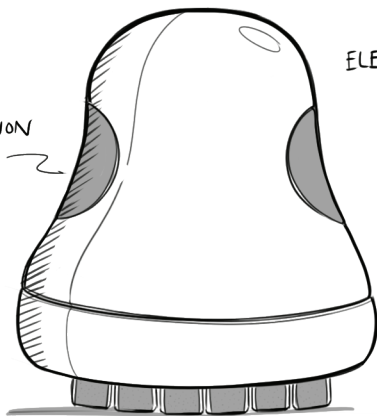
DETATCH HEAD
TO REPLACE

MANUAL RAZOR
HOLD FROM SIDE FOR BETTER GRIP



ELECTRIC RAZOR

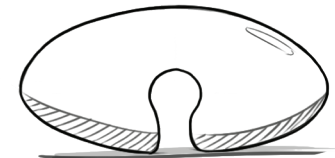
SILICONE CUSHION
FOR THUMBS



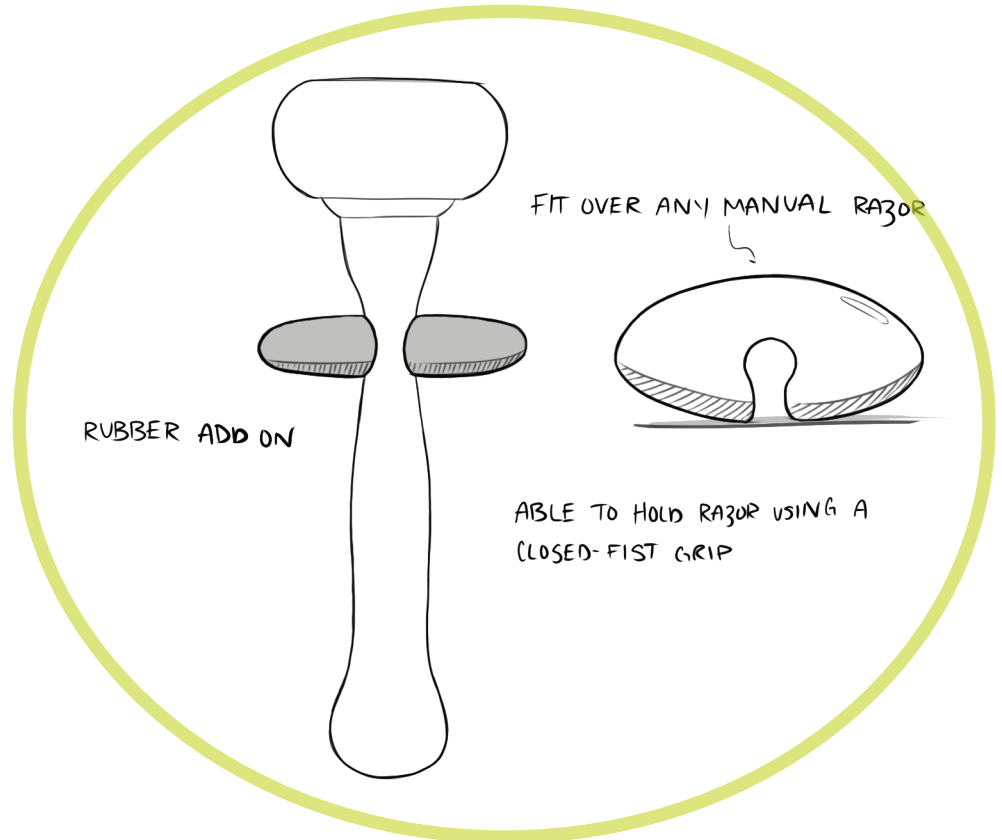
SPRING LOADED, INDIVIDUAL
HEADS CONTOUR TO SKIN UNDERNEATH

RUBBER ADD ON

FIT OVER ANY MANUAL RAZOR



ABLE TO HOLD RAZOR USING A
CLOSED-FIST GRIP





Functional Prototypes

Using arthritis-simulating gloves, I had 3 participants pretend to go through their normal shaving routine using two existing razors and two razor prototypes.

Results



- Confusion on how to hold this concept
- Complaints of wrist strain



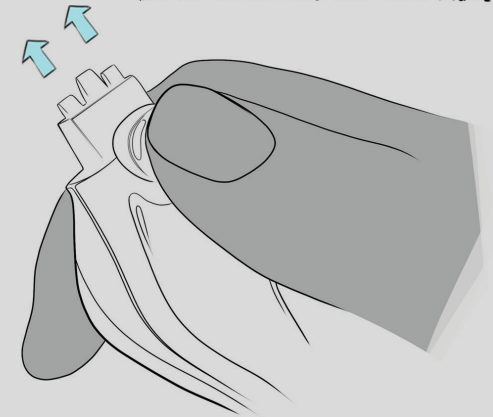
- Favored for length and thickness
- Concern over how this design might limit shaving direction
- One participant found the soap bar beneficial in quickly spotting where the blade was

Exploring Ergonomics

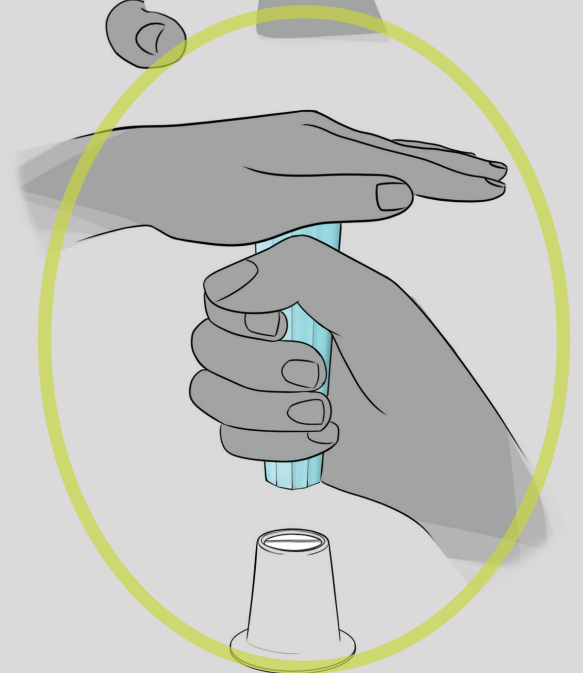
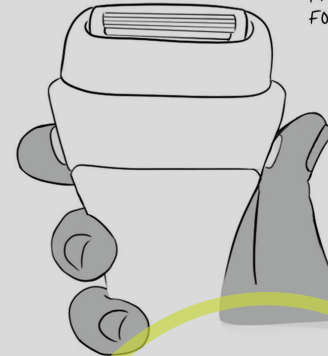
The current motions needed to replace razor blades requires great dexterity.

The motion required to release old razor heads must not strain the hand and offer a sense of security from the blades.

BUTTON SLIDES EJECTOR PINS OUT,
RAZOR HEAD CAN BE PULLED OFF MANUALLY,
BUT ITS UNDESIRABLE AND FEELS UNSAFE

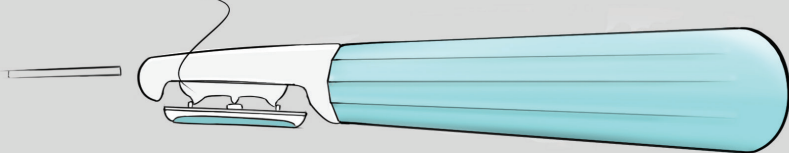


PINCH GRIP CAN BE DIFFICULT
FOR THOSE WITH ARTHRITIS

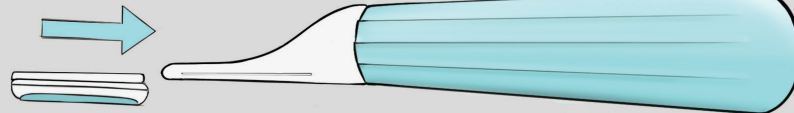


SWIVEL MECHANICS

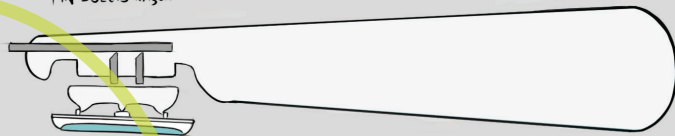
IN ORDER TO HAVE A SWIVEL HEAD,
HEADS CANNOT BE EJECTED AT THE
RAZOR



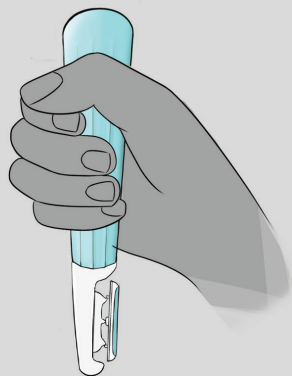
SLIDE ON & OFF



PIN EJECTS RAZOR



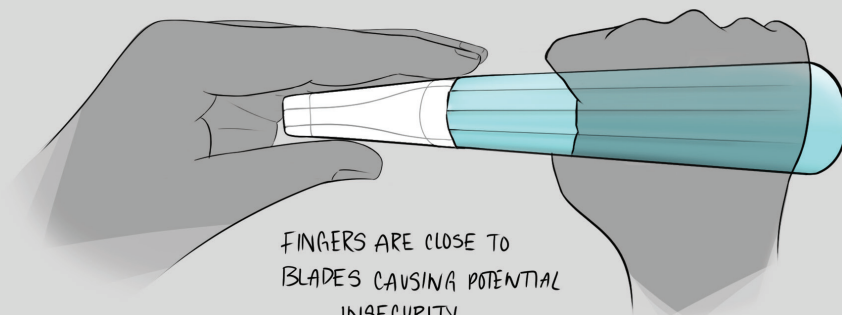
DIFFICULTIES INSERTING
RAZOR



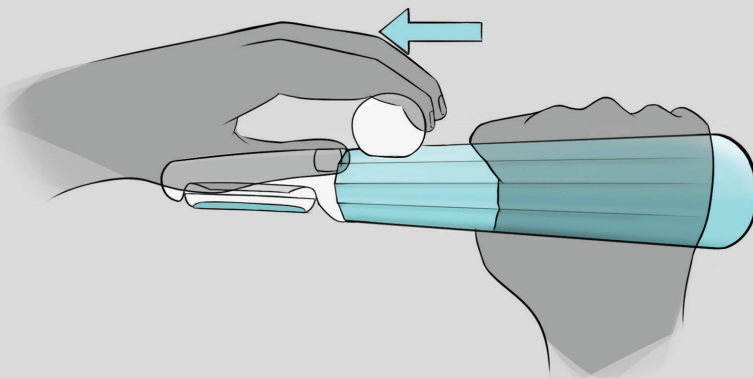
WOULD PLASTIC BE STRONG
ENOUGH? SEEMS LIKE THERE
WOULD STILL BE SOME AIMING



CAP TO REFILL PACKAGE

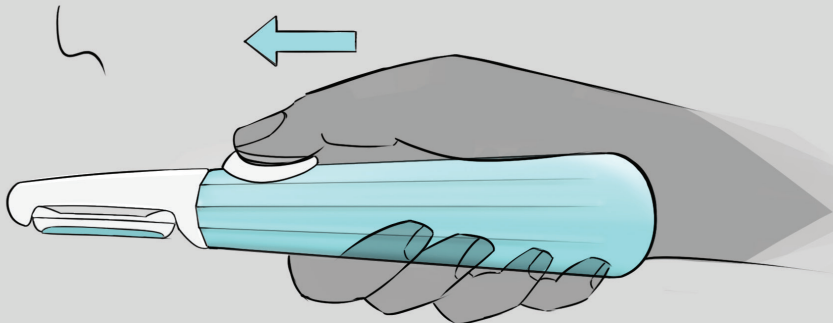


FINGERS ARE CLOSE TO
BLADES CAUSING POTENTIAL
INSECURITY



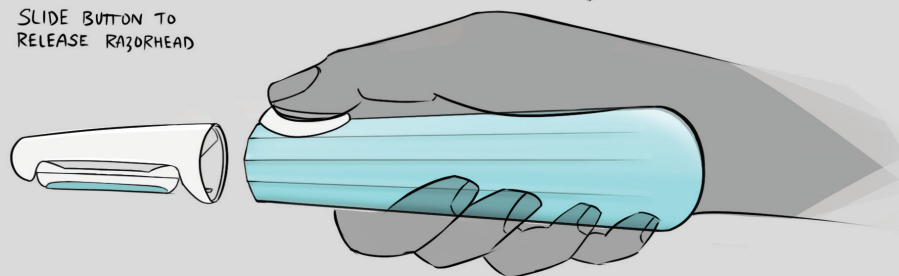
MUST CONTINUE TO IDEATE BIGGER,
MULTI-USE BUTTON + HANDLES

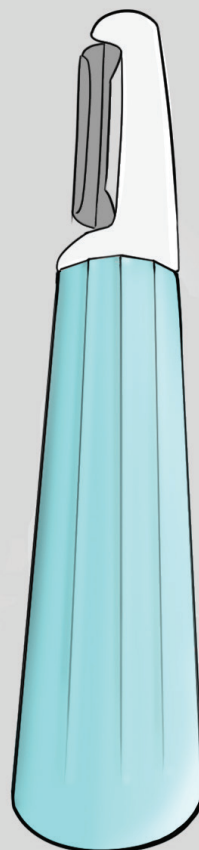
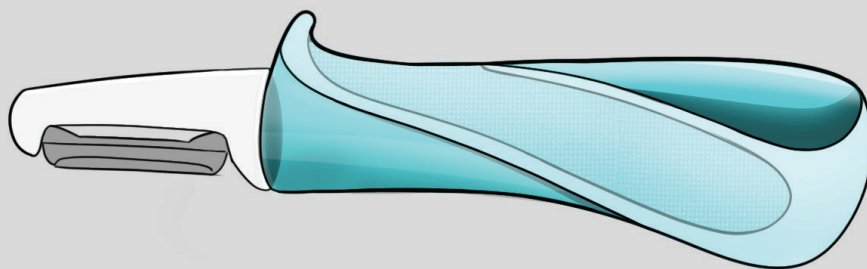
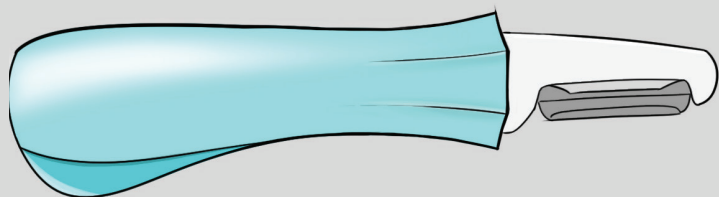
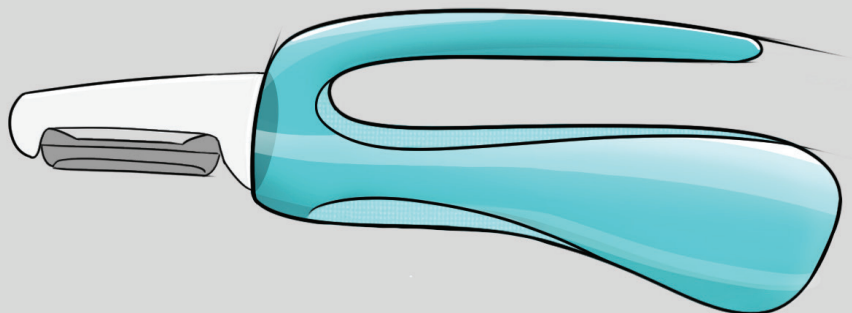
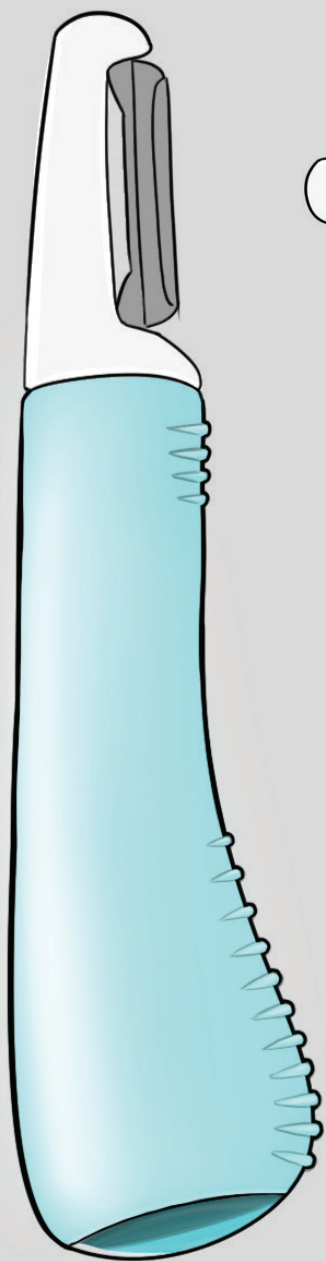
DISPOSABLE RAZOR HEAD



STRAIN

SLIDE BUTTON TO
RELEASE RAZORHEAD





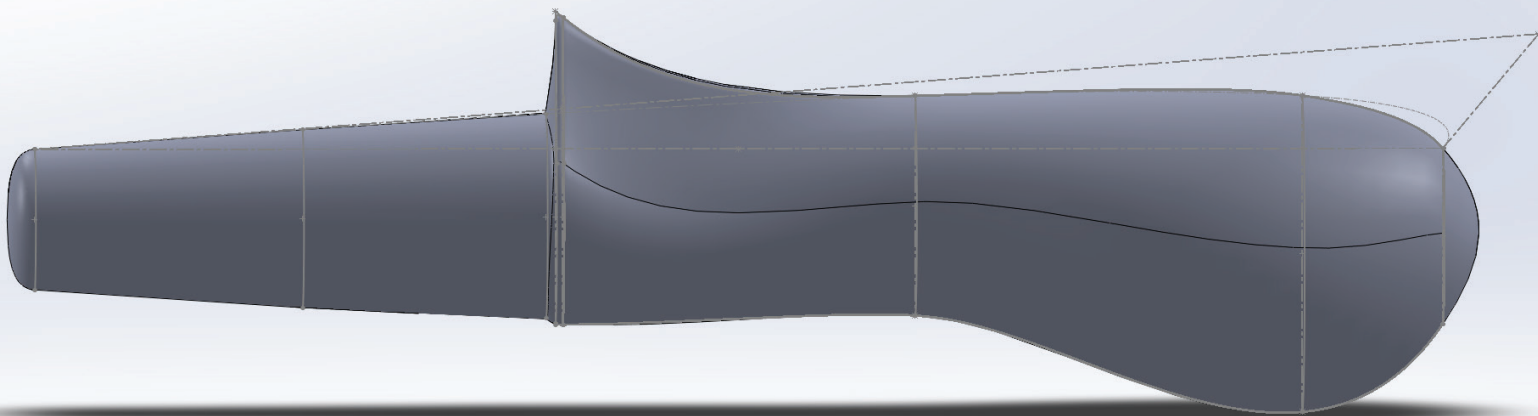
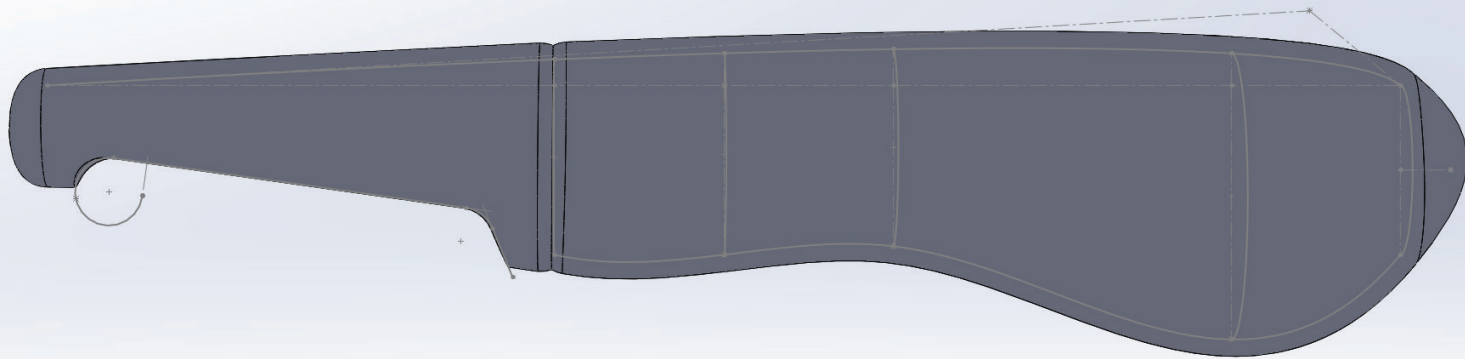
Form Exploration

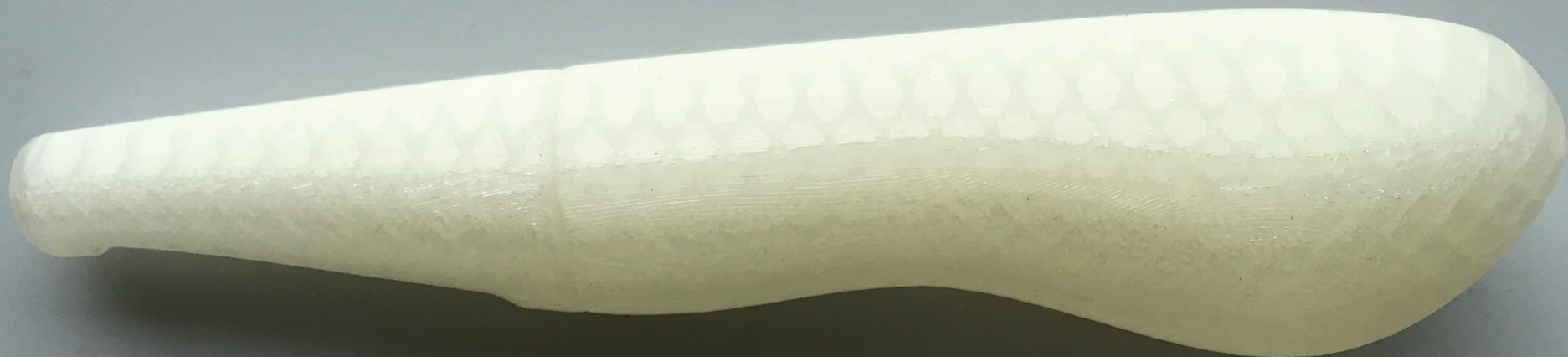
Form exploration focused on ideating ergonomic contours which would increase grip and comfort for those with low dexterity.

Emphasis was placed upon increasing the diameter of the lower handle to provide leverage for weaker outer fingers.

CAD Modeling

Using Solidworks to build early concepts helped me better **understand proportions**.
This also provided the opportunity to 3D print forms for **functional testing**.





Testing

Participants from the previous iteration of testing were asked to imitate their shaving routine with these two new forms.



Participants **enjoyed the “fin”** on top of this handle and how it gave them increased leverage while creating a barrier between their hand and the blade portion.



The bottom diameter of this prototype was **too large**, and participants felt as if their hand continuously slipped toward the blade portion.



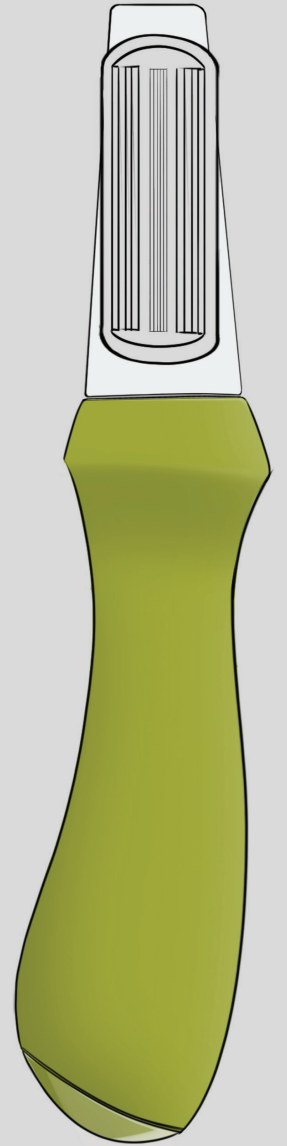
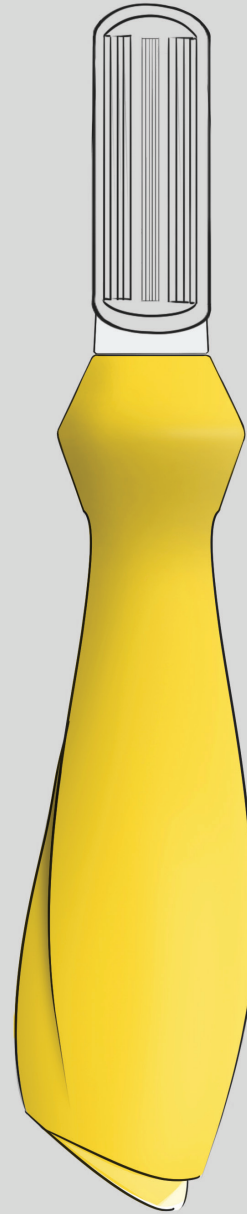
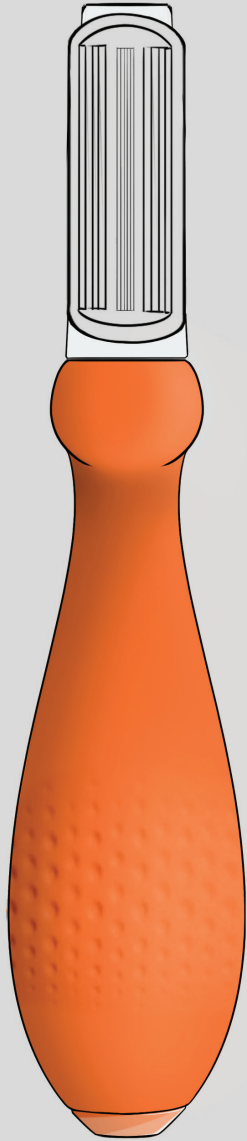
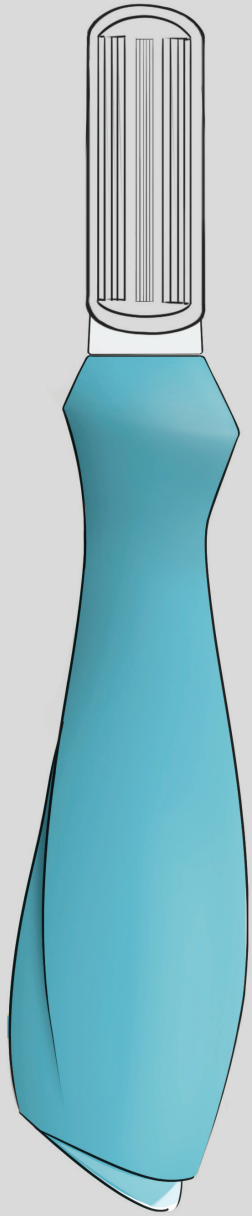
Moodboard

Adjectives such as fun, friendly, inviting, and simple were used to create a moodboard which helped guide the visual brand language of the product.

Continued Design Development

Implementing insights gathered from testing and visual cues from the moodboard, I continued to develop the design of the product.

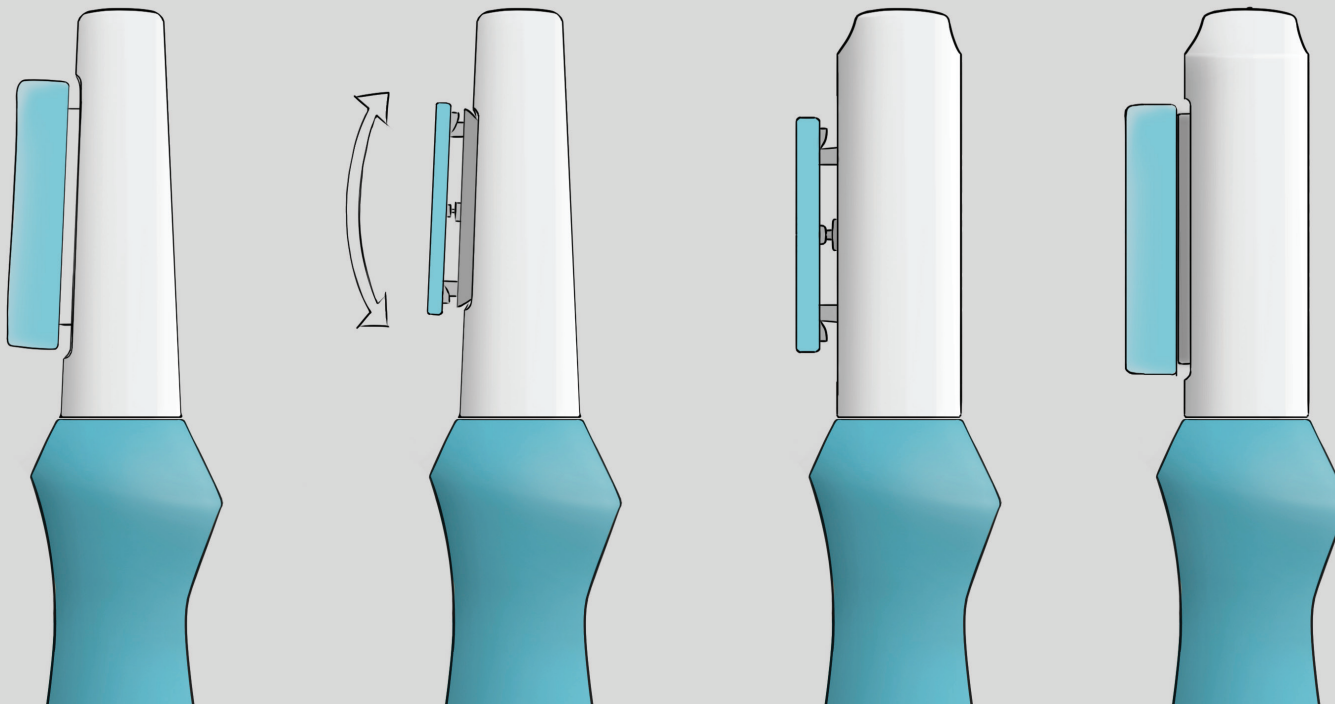
I decided to move forward with the blue design as this concept fit the moodboard best and was the most appealing to peers and past participants.



Razor Head

The features and look of the razor head were dependant upon both needs and cost restriction.

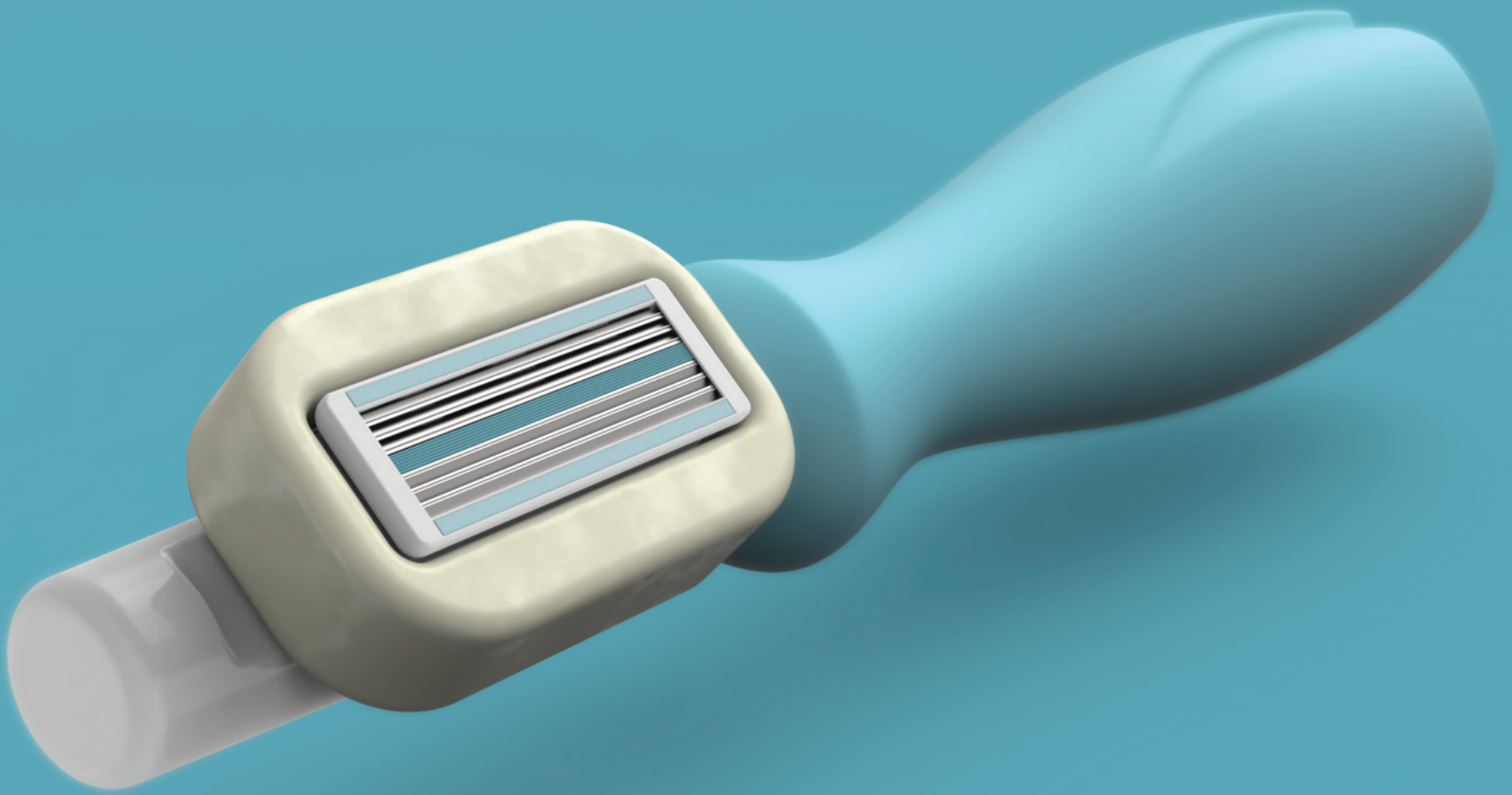
A single-axis razor head with a solid shaving cream bar was chosen. This solid shaving cream bar eliminates the need to apply shaving cream— “saving” one’s hands from unnecessary work.



Design Refinement

Once a final design was chosen, further iterative testing and adjusting was needed to refine the precise measurements of each volumetric area.





Final Design

CLUTCH

